User's Manual

EPIA-SP

Version 1.0
August 2, 2004

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FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

CE

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord in such a way that people cannot step on it. Do not place anything over the power cord.
8. Always unplug the power cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged
    - Liquid has penetrated into the equipment
    - The equipment has been exposed to moisture
    - The equipment has not work well or you cannot get it work according to User's Manual.
    - The equipment has dropped and damaged
    - If the equipment has obvious sign of breakage
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60 C (140F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Explosion or serious damage may occur if the battery is incorrectly replaced. Replace only with the same or equivalent battery type recommended by the manufacturer.

BOX CONTENTS

- ☒ One VIA Mini-ITX mainboard
- ☒ One Quick Installation Guide
- ☒ One ATA-133/100 IDE ribbon cable
- ☒ One driver and utilities CD
- ☒ One IO bracket

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CHAPTER 1

Specifications

The ultra-compact and highly integrated VIA EPIA-SP uses the Mini-ITX mainboard form-factor developed by VIA Technologies, Inc. as part of the company's open industry-wide total connectivity initiative. The mainboard enables the creation of an exciting new generation of small, ergonomic, innovative and affordable embedded systems. Through a high level of integration, the Mini-ITX occupy 66% of the size of FlexATX mainboard form factor. The mainboard comes with an embedded VIA Processor, boasting of ultra-low power consumption, cool and quite operation.

MAINBOARD SPECIFICATIONS

CPU

- VIA C3 / Eden EBGA Processor

Chipset

- VIA CN400 North Bridge
- VIA VT8237 South Bridge

Graphics

- Integrated UniChrome™ Pro AGP with MPEG-2 decoder / MPEG-4 Acceleration

Audio

- VIA VT1617A 6-channel AC'97 Codec

Memory

- 1 x DDR 400 / 333 / 266 DIMM socket (up to 1 GB)

Expansion Slot

- 1 x PCI slot

IDE

- 2 x UltraDMA 133/100 connectors, with Direct DOM Support

LAN

- VIA VT6103 10/100 Base-T Ethernet PHY

IEEE 1394

- VIA VT6307S IEEE 1394 Fire Wire

TV-Out

- VIA VT1623 TV Encoder

Back Panel I/O Ports

- 1 x PS/2 mouse port
- 1 x PS/2 keyboard port
- 1 x RJ-45 LAN port
- 1 x Serial port
- 2 x USB 2.0 ports
- 1 x RCA port (SPDIF or TV out)
- 1 x S-Video port
- 1 x VGA port
- 3 x Audio Jacks: line-out, line-in and mic-in (Horizontal, Smart 5.1 Support)

Onboard I/O Connectors

- 3 x USB connectors for 6 additional USB 2.0 ports
- 1 x IEEE 1394 connector
- 1 x Serial port connector for COM2
- 1 x VIP connector
- 1 x Front Panel audio connector (Mic-in and Line-out)
- 1 x CD audio-in connector
- 1 x FIR connector
- 1 x KBMS connector (KB/MS or CIR)
- 1 x LPT port connector
- 1 x Wake On LAN connector
- 2 x Fan connectors (CPU Fan and System Fan)
- 1 x +12V power connector
- 1 x SMBus connector
- 1 x LVDS

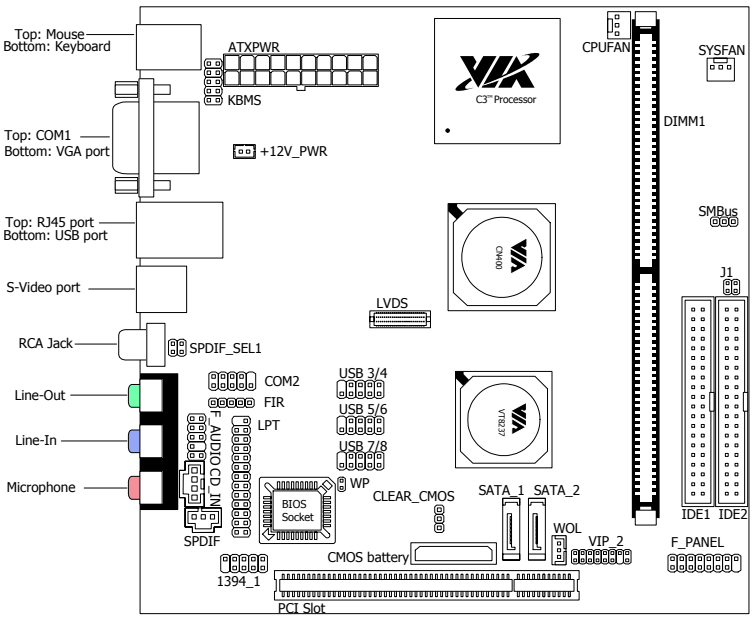
BIOS

- Award BIOS with 4/8Mbit flash memory capacity
- ACPI2.0, SMBIOS2.1 and DMI2.2

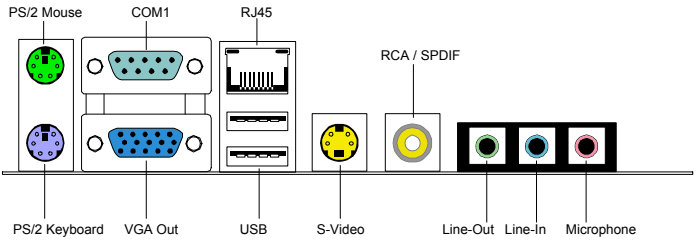
Form Factor

- Mini-ITX (6 layers)
- 17 cm X 17 cm

MAINBOARD LAYOUT



BACK PANEL LAYOUT



BACK PANEL PORTS

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ONBOARD CONNECTORS

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CHAPTER 2

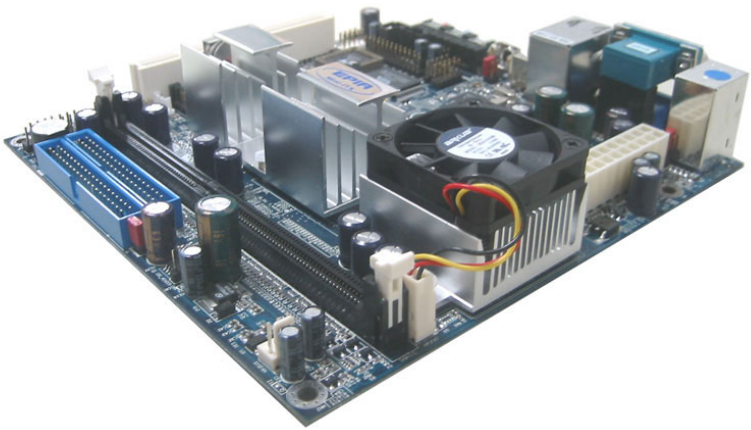
Installation

This chapter provides you with information about hardware installation procedures. It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

CPU

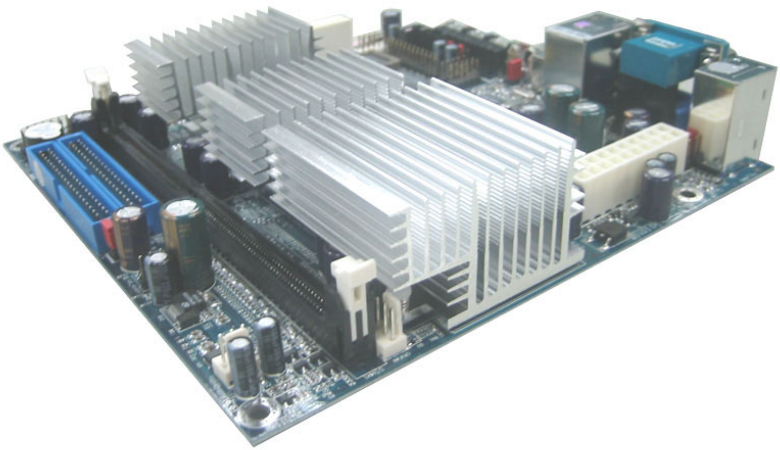
The VIA C3 E-Series Processor

The VIA EPIA-SP Mini-ITX mainboard includes an embedded VIA C3 or Eden Processor. The VIA C3 Processor provides ultra-low power consumption and advanced thermal dissipation properties. The VIA C3 Processor requires heatsink and a CPU fan to provide sufficient cooling. Ensure that the CPU fan is correctly installed as shown.



The VIA Eden Processor

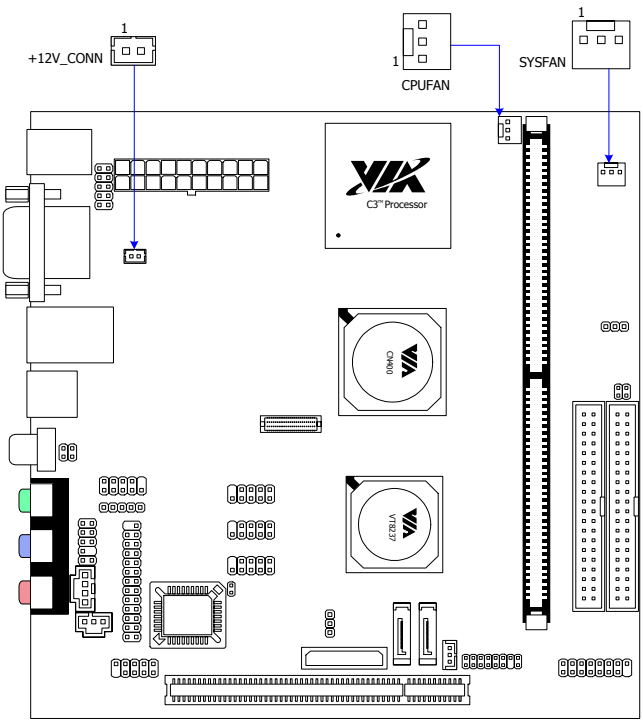
Providing ultra-low power consumption and advanced thermal dissipation properties, the VIA Eden Processor features a fanless design. The VIA Eden Processor requires only a heatsink as shown.



WARNING: This mainboard is not designed to support overclocking. Any attempt to operate beyond product specifications is not recommended. *We do not guarantee the damage or risks caused by inadequate operation or beyond product specifications*.

CPU Fan and System Fan: CPUFAN and SYSFAN

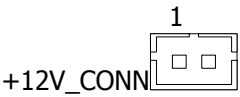
The CPUFAN (CPU fan) and SYSFAN (system fan) run on +12V and maintain system cooling. When connecting the wire to the connectors, always be aware that the red wire is the Positive and should be connected to the +12V. The black wire is Ground and should always be connected to GND. The CPU system and power fan connectors have sensors to support fan monitoring except for +12V_CONN.



+12V Power Connector

This 12V power connector is used to provide additional +12V power to the rest of the system.

Pin	Signal
1	+12V
2	GND

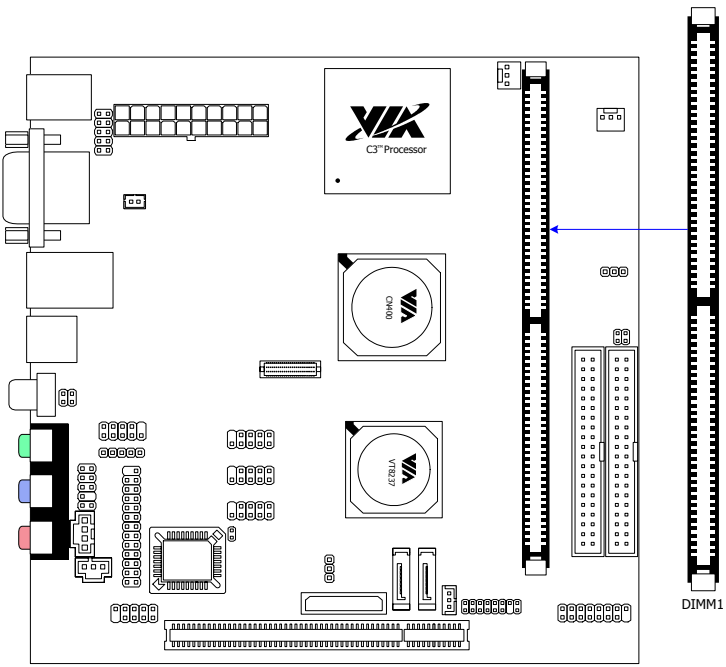


MEMORY MODULE INSTALLATION

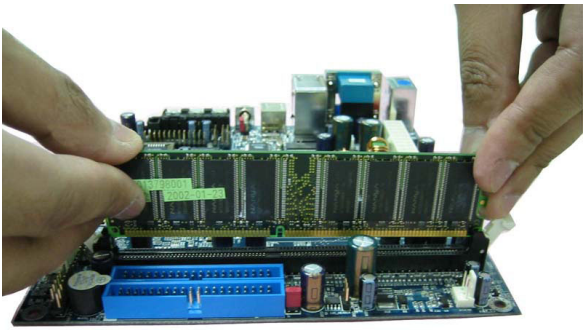
The VIA EPIA-SP Mini-ITX mainboard provides one 184-pin DIMM slot for DDR400/333/266 SDRAM memory modules and supports the memory size up to 1GB.

DDR SDRAM Module Installation Procedures

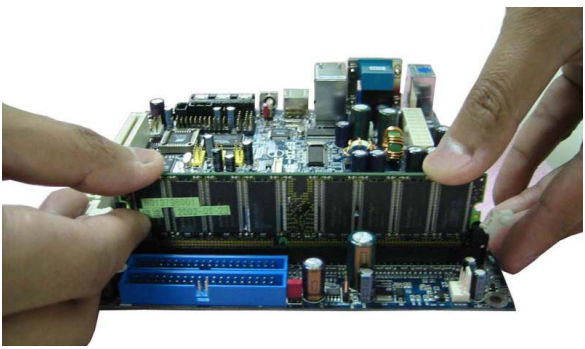
- Locate the DIMM sockets in the motherboard.



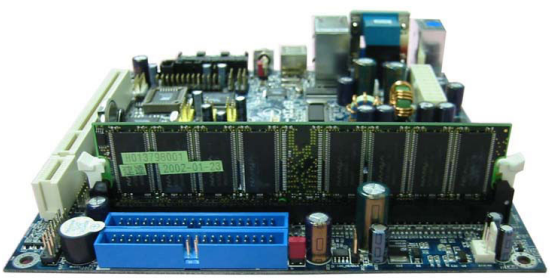
- Unlock a DIMM socket by pressing the retaining clips outward.



- Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



- Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



Available DDR SDRAM Configurations

Refer to the table below for available DDR SDRAM configurations on the mainboard.

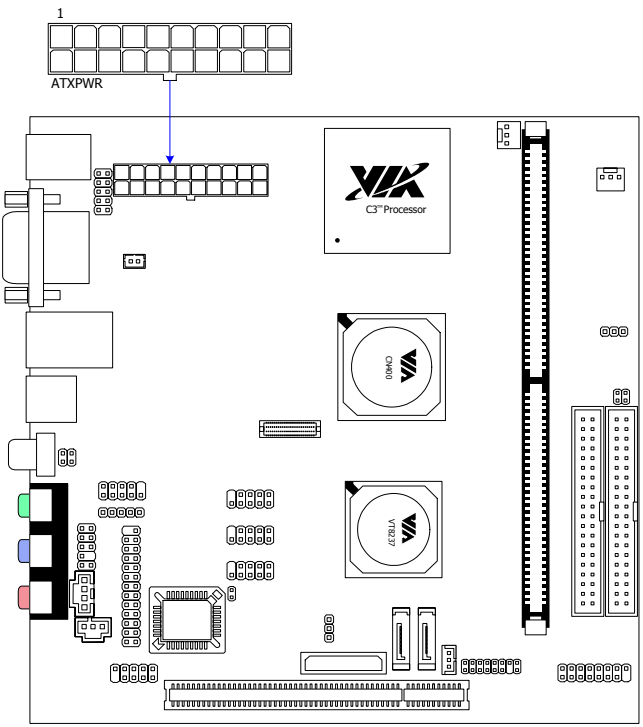
Slot	Module Size	Total
DIMM	64MB, 128MB, 256MB, 512MB, 1GB	64MB-1GB
Maximum supported system memory		64MB-1GB

CONNECTING THE POWER SUPPLY

The VIA EPIA-SP Mini-ITX mainboard supports a conventional ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed correctly to ensure that no damage will be caused.

ATX 20-Pin Power Connector

To connect the ATX power supply, make sure the power plug is inserted in the proper orientation and the pins are aligned. Then push down the plug firmly into the connector.

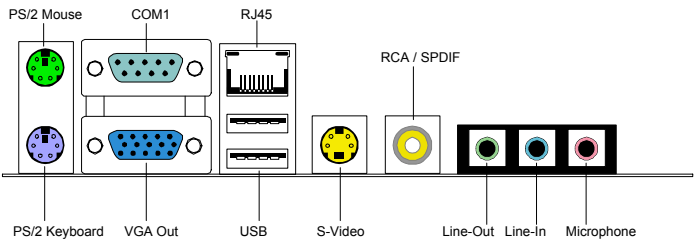


ATX 20 Pin Power Connector

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	Power Supply On
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power Good	18	NC
9	+5V Standby	19	+5V
10	+12V	20	+5V

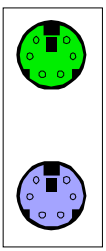
BACK PANEL PORTS

The back panel has the following ports:



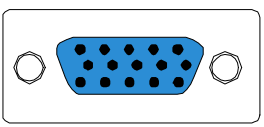
Keyboard and Mouse

The green 6-pin connector is for a PS/2 mouse. The purple connector is for a PS/2 keyboard.



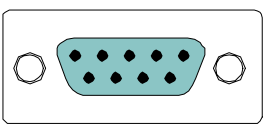
VGA Out

The 15-pin female VGA connector can be used to connect to any analog VGA monitor.



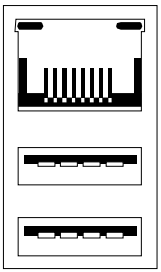
Serial port: COM 1

This 9-pin COM 1 port is for pointing devices or other serial devices.



RJ45 10/100 LAN Connector

The mainboard provides a standard RJ-45 port. This port allows connection to a Local Area Network (LAN) through a network hub

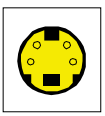


USB 2.0 ports 1and 2

These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

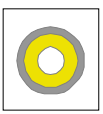
S-Video port

This port allows you to connect TV monitor or S-video device to the mainboard.



SPDIF jack

This jack connects to external audio output devices.



Audio Port:

Line Out jack

This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.

Line In jack

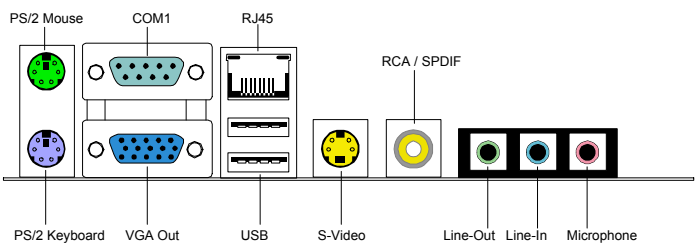
This Line In (light blue) jack connects a tape player or other audio devices. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

Microphone jack

This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Bass / Center Speaker Out.

Note:
The audio ports can be switched to Smart 5.1 6-channel audio output. You can enable the function by clicking the "Vinyl Audio" icon on your desktop after installing the audio driver.

After completing the previous installation, connect the speakers to the 3-jack connectors on the back panel as shown.



Shown below are the corresponding connections to setup the 6-channel system.

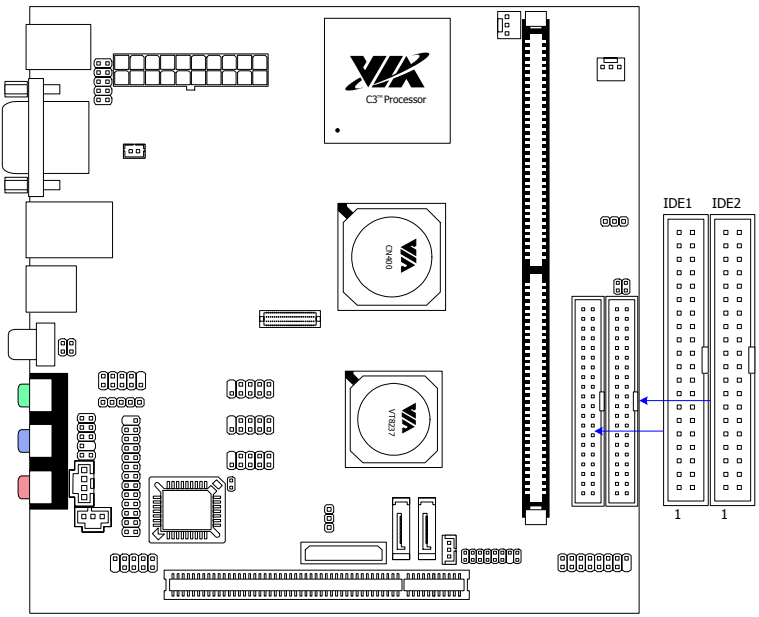
Jack	2-channel	6-channel
Line-out	Line-out	Front (Left/Right)
Line-in	Line-in	Rear (Left/Right)
Microphone	Microphone	Center/Sub-woofer

CONNECTORS

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced IDE and Ultra DMA 133/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 133/100 functions. You can connect up to four hard disk drives, CD-ROM and other devices.

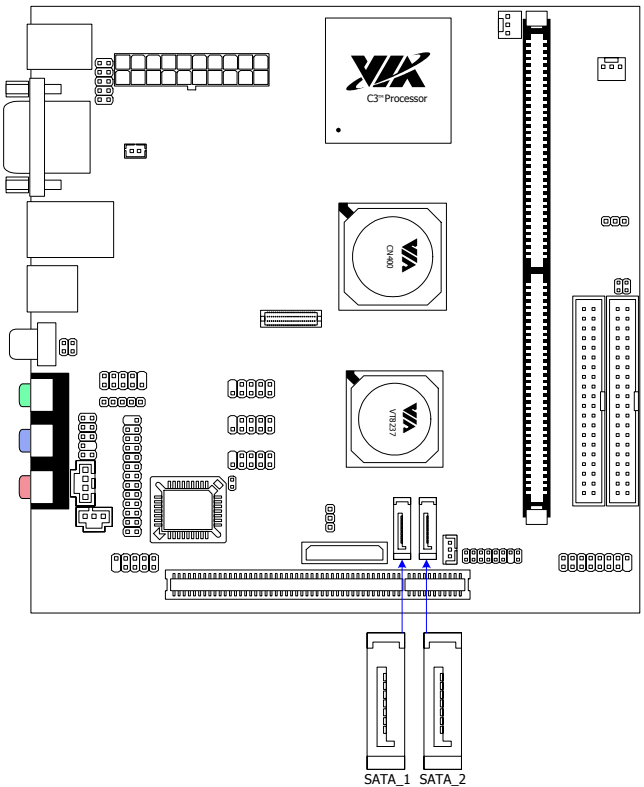
The primary hard drive should always be connected to IDE1 as the master drive. Both IDE drives can connect to a master and a slave drive.



If two drives are connected to a single cable, the jumper on the second drive must be set to slave mode. Refer to the drive documentation supplied by the vendor for the jumper settings. Both IDE1 and IDE2 have a 20th pin included. The 20th pin was added to provide extra voltage to power 40-pin Disk-on Modules (DOM). See voltage selector: J1 on page 38 and 40. You must use IDE cables that do not block the 20th pin.

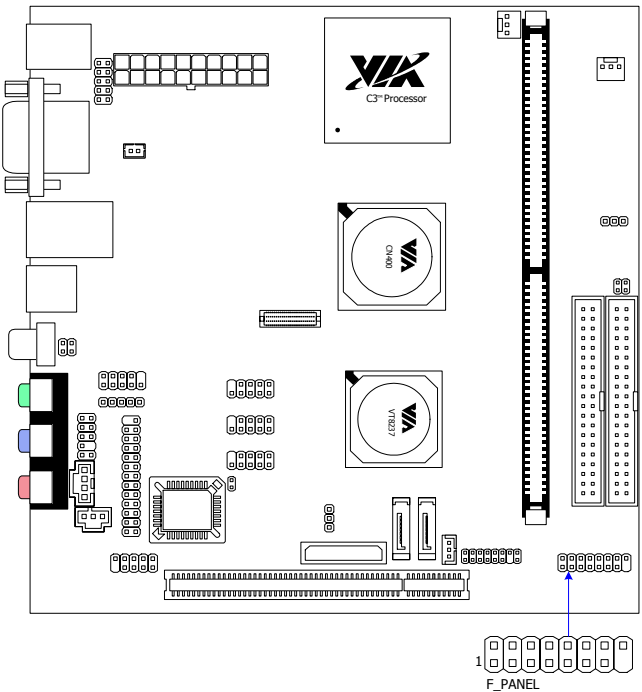
Serial ATA Connectors: SATA1 and SATA2

These next generation connectors support the thin Serial ATA cables for primary internal storage devices. The current Serial ATA interface allows up to 150MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra DMA).



Case Connector: F_PANEL

The F_PANEL connector allows you to connect the power switch, reset switch, power LED, HDD LED and the case speaker.



Case Connector: F_PANEL

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5V
3	+5VDUAL	4	HD_LED
5	-PLED	6	PW_BN
7	+5V	8	GND
9	NC	10	RST_SW
11	NC	12	GND
13	SPEAK	14	+5V
15	Key	16	-SLEEP_LED

Power Switch (PW_BN)

Connect to a 2-pin power button switch. Pressing this button will turn the system power on or off.

Reset Switch (RST_SW)

The reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting the system, if the HDD is still working. Connect the reset switch from the system case to this pin.

Power LED (-PLED)

The LED will light when the system is on. If the system is in S1 (POS - Power On Suspend) or S3 (STR - Suspend To RAM) state, the LED will blink.

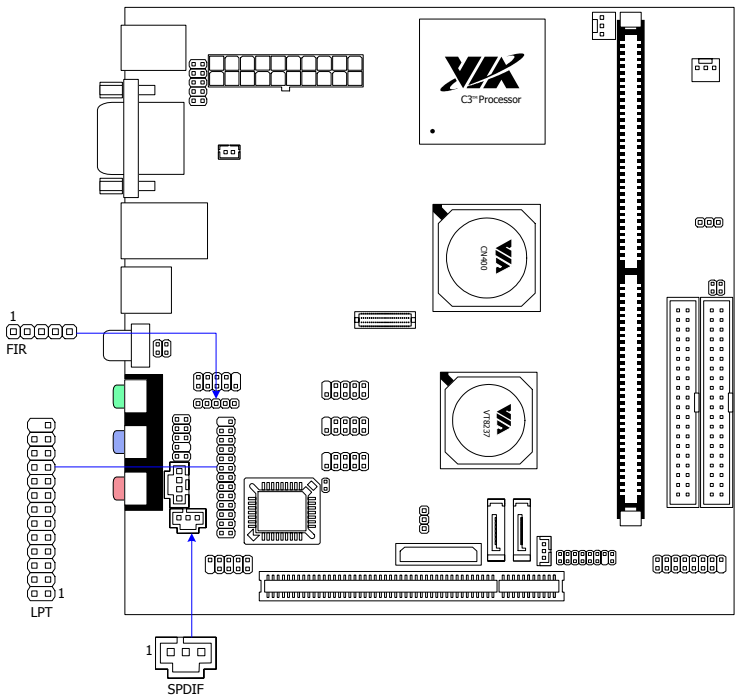
HDD LED (HD_LED)

HDD LED shows the activity of a hard disk drive. Avoid turning the power off when the HDD LED still has a lit. Connect the HDD LED from the system case to this pin.

Fast IrDA Infrared Module Connector: FIR

This connector is used to connect to an IrDA module. The BIOS settings must be configured to activate the IR function.

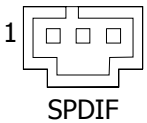
Pin	Signal	Description
1	+5V	VCC
2	IRRX1	FIR/SIR Data Receive
3	IRRX	SIR Data Receive
4	GND	Ground
5	IRTX	FIR/SIR Data Transmit



Digital Audio Connector: S/PDIF

This connector is for connecting the Sony Philips Digital Interface (S/PDIF) bracket. The S/PDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The feature is available only with stereo system that has digital output function.

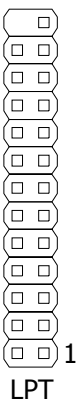
Pin	Signal
1	+5V
2	S/PDIF
3	GND



Parallel Port Connector: LPT

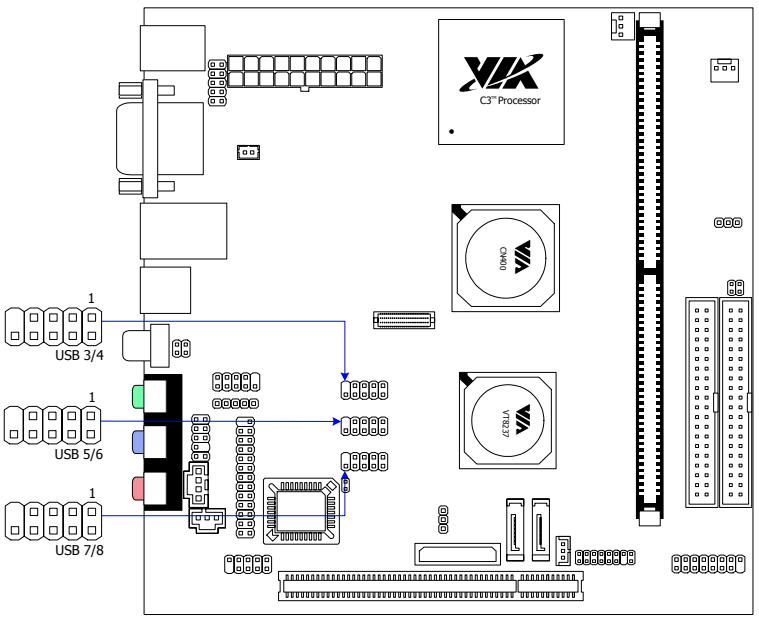
The mainboard provides a 25-pin port to be able to connect a 25-pin female external connector for LPT (parallel port). A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) modes.

Pin	Signal	Pin	Signal
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		



USB Pin Connectors: USB 3-4, 5-6, and 7-8

The mainboard provides 3 front USB pin–header connectors, allowing up to 6 additional USB2.0 ports up to maximum throughput of 480 Mbps. Connect each 2-port USB cable into each pin-headers. These ports can be used to connect high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modem and the like.

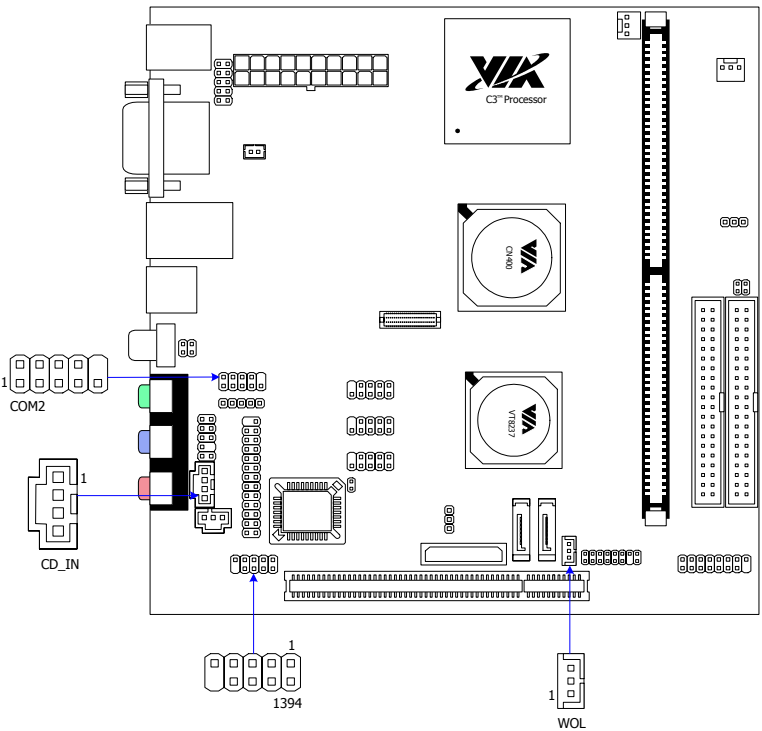


USB connectors: USB 3-4, 5-6, and 7-8

Pin	Signal	Pin	Signal
1	USBVCC	2	USBVCC
3	USBD_T2-	4	USBD_T3-
5	USBD_T2+	6	USBD_T3+
7	GND	8	GND
9	Key	10	GND

Wake-On LAN: WOL

This connector allows you to connect a network card with the Wake-On LAN function. The connector will power up the system when a signal is received through the network card. Please note that the function of ACPI WOL may be disabled when users will unplug the power cord or turn off the power button manually.



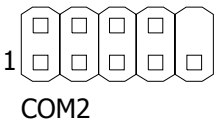
Wake-On LAN connector: WOL

Pin	Signal	Description
1	+5VDUAL	VCC
2	GND	Ground
3	WOL IN	Wake on LAN Input

Serial Port: COM 2

COM2 can be used to attach additional port for serial mouse or another serial device.

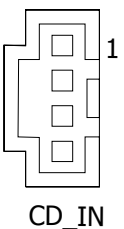
Pin	Signal	Pin	Signal
1	DCD	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	Key



CD Audio Connector: CD_IN

This connector allows you to receive stereo audio input from sound source such as a CD-ROM.

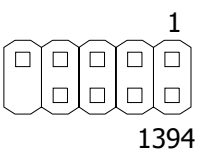
Pin	Signal
1	Left channel
2	GND
3	GND
4	Right channel



FireWire: IEEE1394

FireWire is a serial I/O interface that provides you fast data transfer rates. The mainboard has one FireWire port to provide PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs and portable devices.

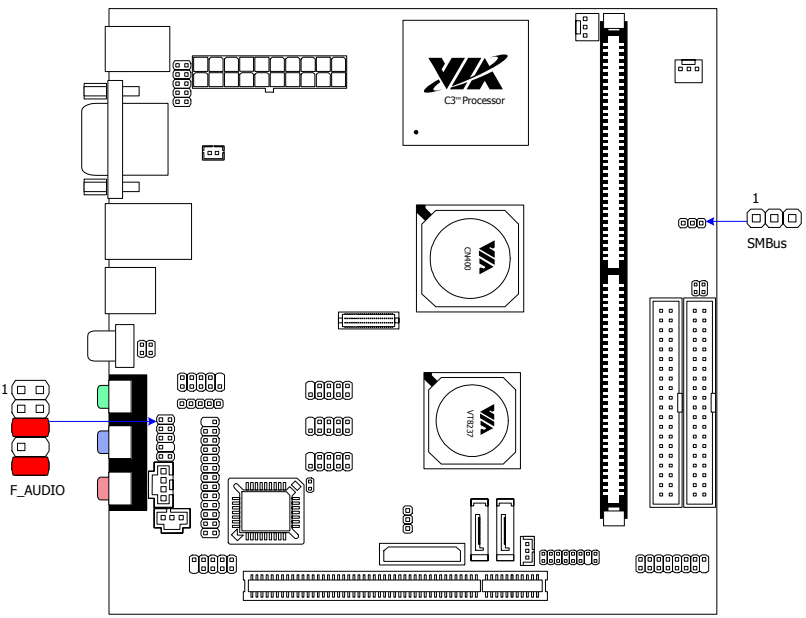
Pin	Signal	Pin	Signal
1	TPA0+	2	TPA0-
3	GND	4	GND
5	TB0+	6	TPB0-
7	1394_VDD	8	1394_VDD
9	GND	10	Key



System Management Bus Connector: SMBus

The connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

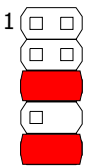
Pin	Signal
1	SMBCK
2	SMBDT
3	GND



Front Panel Audio Connector: F_AUDIO

This is an interface for the VIA front panel audio cable that allow convenient connection and control of audio devices. By default, the pins labeled LINE_OUT_R/NEXT_R and the pins LINE_OUT_L/NEXT_L are shorted with jumper caps. Remove the caps only when you are connecting the front panel audio cable.

Pin	Signal	Description
1	FRNMIC	Front panel microphone input
2	AGND	Ground used by analog audio circuit
3	MIC_BIAS	Microphone power
4	+5V AUDIO	VCC used by analog audio circuit
5	LINE_OUT_R	Right channel audio signal
6	NEXT_R	Right channel audio signal return
7	NC	No connection
8	Key	No pin
9	LINE_OUT_L	Left channel audio signal
10	NEXT_L	Left channel audio signal return



F_AUDIO

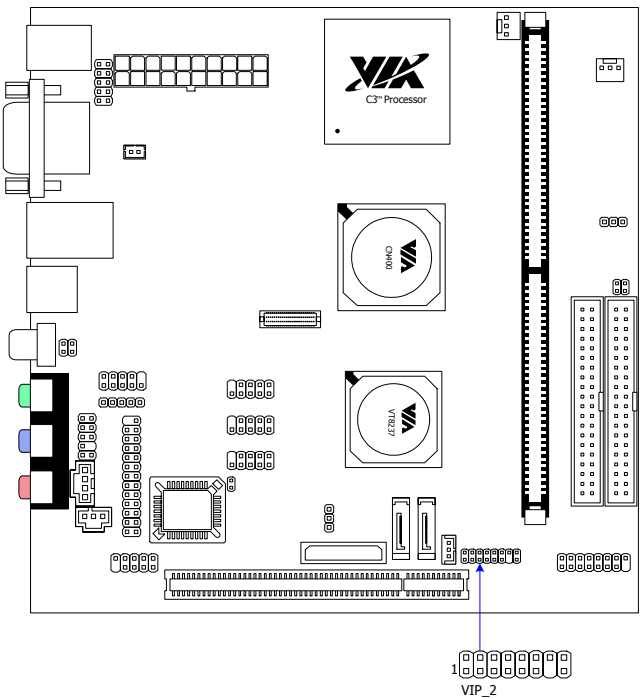
Note:

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.

Video Interface Port Pin Connector: VIP_2

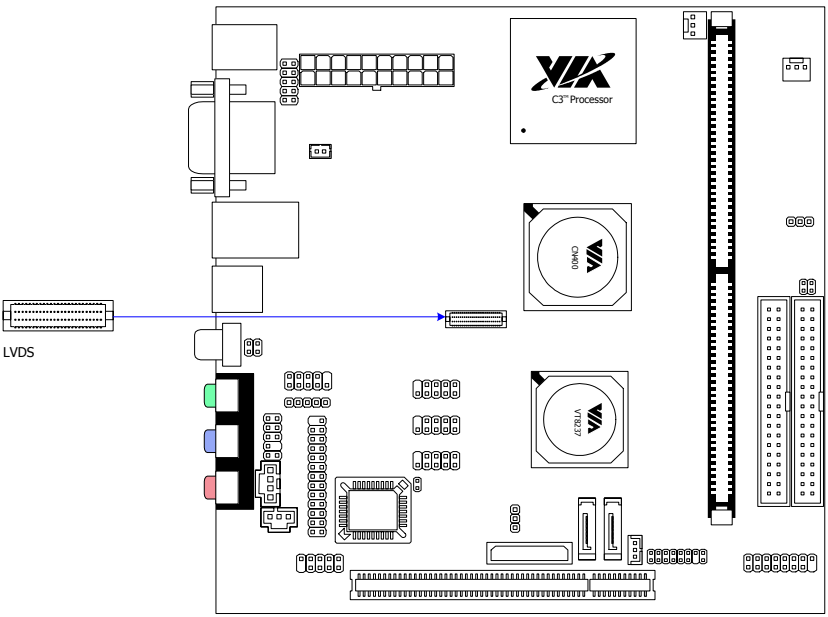
This connector allows you to use the capture function inside the North Bridge.

Pin	Signal	Pin	Signal
1	GND	2	CAPD0
3	CAPD7	4	CAPD4
5	CAPD6	6	CAPD5
7	GFPHS	8	CAPD2
9	CAPD1	10	CAPD3
11	GFPVS	12	CAPCLK
13	SMBDT	14	KEY
15	SMBCK	16	GND



LVDS Connector:

This connector is for devices requiring display interface such as LVDS, and TTL. The LVDS connector may not be available on your mainboard. This is an option that is added during the manufacturing process. If you would like a mainboard with the LVDS connector, please contact your vendor or sales contact for more information.



LVDS Connector

Pin	Signal	Pin	Signal
1	GND	2	+5V
3	GFPCLK	4	+5V
5	GND	6	GND
7	GFPD12	8	GFPD15
9	GFPD11	10	GFPD14
11	GFPD1	12	GFPD3
13	GND	14	GND
15	GFPD6	16	GFPD16
17	GFPD7	18	GFPD17
19	GFPD0	20	GFPD2
21	GND	22	GND
23	GFPD4	24	GFPD18
25	GFPD8	26	GFPD19
27	GND	28	GND
29	GFPD5	30	GFPD21
31	GFPD9	32	GFPD20
33	GND	34	GND
35	GFPD10	36	GFPD22
37	GFPD13	38	GFPD23
39	GND	40	GND
41	ENPVDD	42	GFPVS
43	ENPVEE	44	GFPHS
45	FPBKLP	46	GFPDE
47	PWRGD_SB	48	TVBSCK_R
49	+3.3V	50	TVBSDA_R

Note:

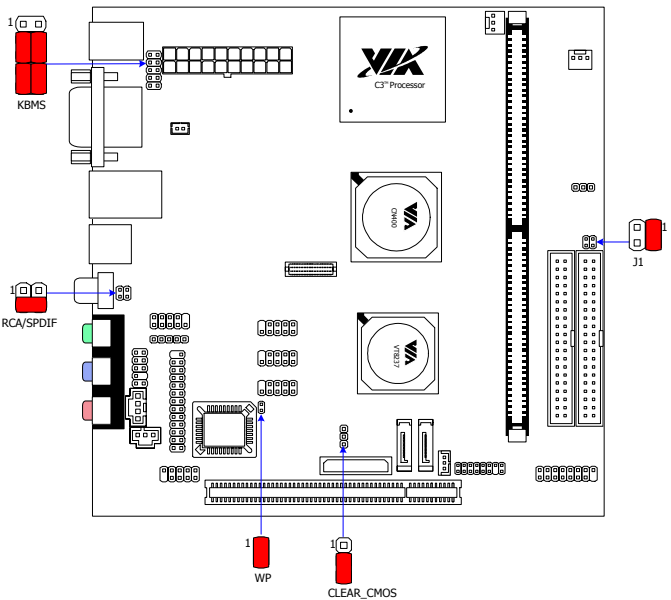
ENPVDD: Enable Panel VDD power

ENVEE: Enable panel VEE power

GFPD: Graphic Flat Panel Device signals.

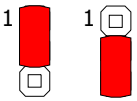
JUMPERS

The mainboard provides jumpers for setting some mainboard functions. This section will explain how to change the settings of the mainboard functions using the jumpers.



Clear CMOS: CLEAR_CMOS

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS that include system setup information such as system passwords.



1-2: Normal (Default)
2-3: Clear CMOS

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Replace the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

WARNING: Except when clearing the RTC RAM, never remove the cap on CLEAR_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.